

Modeling Organizational Systems



CST 270 – System Analysis & Design
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Objectives

- Discuss three means to depict systems graphically including data flow diagrams, E-R diagrams, and use cases/scenarios
- Explain the means context-level data flow diagrams use to depict systems
- Discuss the Entity Relationship model including entities and their relationships
- Explain use case modeling and its major elements including actors, behavior relationships, and their graphical depictions
- Discuss use case scenarios including the major sections and their elements

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Depicting Systems Graphically

- Context-level data flow diagrams
- Entity-relationship model
- Use case modeling

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Context-Level Data Flow Diagrams

- Focus is on the data flowing into and out of the system and data processing
- Shows the scope of the system:
 - What is to be included in the system
 - The external entities are outside the scope of the system
- We'll revisit these after our first exam!

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Entity-Relationship Models

- Focus is on the entities and their relationships within the system
 - Another way to show the scope of a system
- Relationships show how the entities are connected.
- We'll see more about this very soon!

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Use Case Modeling

- Describes **what** a system does without describing **how** the system does it
 - A **logical model** of the system
- Use case is a view of the system requirements
 - Analyst works with business experts to develop requirements

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Use Case Diagram

- Actor
 - Refers to a particular role of a user of the system
 - Similar to external entities; they exist outside of the system
- Use case symbols
 - An oval indicating the task of the use case
- Connecting lines
 - Arrows and lines used to diagram behavioral relationships

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Actor

- Divided into two groups
 - Primary actors:
 - Supply data or receive information from the system.
 - Provide details on what the use case should do.
 - Supporting actors:
 - Help to keep the system running or provide help.
 - The people who run the help desk, the analysts, programmers, and so on.

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A Use Case Always Provides Three Things

- An actor that initiates an event
- The event that triggers a use case
- The use case that performs the actions triggered by the event

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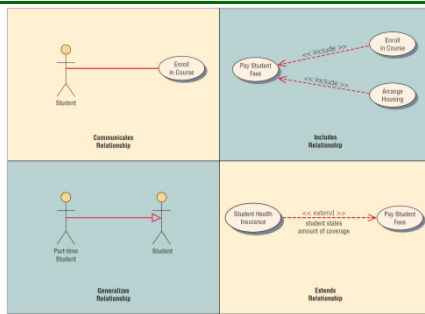
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Behavioral Relationships

- Communicates
 - Used to connect an actor to a use case
- Includes
 - One use case can be included in another
- Extends
 - One use case can extend another
- Generalizes
 - One use case can be more general than another use case

Relationship	Symbol
Communicates	—
Includes	← << include >>
Extends	--- << extend >> →
Generalizes	—▷

Use Cases EX (Fig.2.14)



Scope

- System scope defines its boundaries:
 - What is in or outside the system
 - projects have limiting factors (time, money, people) which define the system scope
- Actors are always outside of scope
- Communication lines are the boundaries and define the scope

Developing Use Case Diagrams

- Review the business specifications and identify the actors involved.
- May use agile stories.
- Identify the high-level events and develop the primary use cases that describe those events and how the actors initiate them.
- Review each primary use case to determine the possible variations of flow through the use case.
- The context-level data flow diagram could act as a starting point for creating a use case

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A Use Case Diagram EX (Fig. 2.15)



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Developing Use Case Scenarios

- The description of the use case
- Three main areas:
 - Use case identifiers and initiators
 - Steps performed
 - Conditions, assumptions, and questions

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Use Case Scenario (3 sections)

Use case name:	Register for Conference	Use Case ID:	ConfReg003
Act:	Conference Planning		
Actor(s):	Participant		
Stakeholder:	Conference Sponsor, Conference Organiser		
Level:	Use Case		
Description:	Allow conference participant to register online for the conference using a secure Web site.		
Trigger event:	Participant visits Conference Registration Web site, enters userID and password, and clicks the login button.		
Trigger type:	Eventual	Temporal	
Steps Performed (Main Path):	1. Participant logs in (using the secure Web browser) Information for 2009 userID, Password		
More steps included here...			
12. Successful Registration Confirmation Web page is sent to the participant.	Registration Record Confirmation Number		
Preconditions:	Participant has already registered and has created a user account		
Postconditions:	Participant has successfully registered for the conference.		
Assumptions:	Participant has an Internet and a valid userID and password.		
Success Guarantees:	Participant has registered for the conference and is enrolled in all selected sessions.		
Minimum Guarantees:	Participant user able to login.		
Requirements list:	Allow conference participants to be able to register for the conference using a secure Web site.		
Outstanding Issues:	How should a rejected credit card be handled?		
Priority:	High		
Risk:	Medium		

Use Case Header Area

- Has a name and a unique ID
- Include application area
- List actors
- Include stakeholders
- Include the level
- Has a brief description of the use case

Use Case Levels

- Use case levels describe how global or detailed the use case description is:
 - White (like clouds): enterprise level
 - Kite: business unit or department level
 - Blue (sea level): user goals
 - Indigo (or fish): functional or subfunctional
 - Black (or clam): most detailed

Use Case Footer Area

- Preconditions—need to be met before use case can be performed
- Postconditions or the state of the system after the use case has finished
- Assumptions
- Minimal guarantee
- Success guarantee
- Outstanding issues
- Optional priority and risk

Four Steps Used to Create Use Cases

- Use agile stories, problem definition objectives, user requirements, or a features list
- Ask about the tasks that must be done
- Determine if there are any iterative or looping actions
- The use case ends when the customer goal is complete

Why Use Case Diagrams ???

- Identify all the actors in the problem domain.
- Actions that need to be completed are also clearly shown on the use case diagram.
- The use case scenario is also worthwhile.
- Simplicity and lack of technical detail

Why Use Case Diagrams ???

- Use Cases effectively communicate systems requirements because of their simplicity
- Use cases allow people to tell stories
- Use cases make sense to non-technical staff
- Use cases do not depend on special languages
- Use cases can describe most functional requirements
- Use cases help analysts define boundaries
- Use cases can be traceable (use with tools)

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Summary

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Questions?



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